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SYSTEM AND METHOD FOR INFORMATION HANDLING SYSTEM CONSUMABLE AUTOMATIC ORDERING

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BACKGROUND OF THE INVENTION

Field of the Invention

10 The present invention relates in general to the field of information handling system consumables, and more particularly to a system and method for information handling system consumable automatic ordering.

Description of the Related Art

As the value and use of information continues to increase, individuals and businesses seek additional ways to process and store information. One option
15 available to users is information handling systems. An information handling system generally processes, compiles, stores, and/or communicates information or data for business, personal, or other purposes thereby allowing users to take advantage of the value of the information. Because technology and information handling needs and requirements vary between different users or applications, information handling
20 systems may also vary regarding what information is handled, how the information is handled, how much information is processed, stored, or communicated, and how quickly and efficiently the information may be processed, stored, or communicated. The variations in information handling systems allow for information handling systems to be general or configured for a specific user or specific use such as financial
25 transaction processing, airline reservations, enterprise data storage, or global communications. In addition, information handling systems may include a variety of hardware and software components that may be configured to process, store, and

communicate information and may include one or more computer systems, data storage systems, and networking systems.

Information handling systems typically use one or more peripherals to manage, communicate or display information. For instance, information handling systems generally interface with external printers for printing information, such as documents written by word processing applications, presentations having graphics to explain or sell products, and multimedia pictures or photographs. Typically, the operating system of the information handling system includes a driver that manages the transfer of information to printed media. Often, networked information handling systems interface with a number of printers through a network that allows a user to select printing based on media, quantity and quality constraints. For instance, laser printers use toner from toner cartridges to print documents in color or black and white with high resolution in a relatively rapid manner. Ink jet printers use ink cartridges of various colors to print documents and photographs with high resolution but at a generally slower rate compared with laser printers. Thus, businesses tend to favor the more-expensive laser printers due to their high output rates while individuals tend to favor less-expensive ink jet printers due to their flexibility, particularly in the printing of photographs.

One difficulty faced by information handling system users is keeping the toner and ink of printers adequately supplied so that the availability of a printer is not lost while supplies are ordered. To aid in timely purchase of toner and ink, printer manufacturers sometimes include user interfaces that provide timely warnings of the need to order supplies and that point the user to a web site at which the user may purchase supplies. Although the timely warning is helpful, individual users are often hesitant to order through the Internet out of privacy concerns and the timeliness of the delivery of the supplies. Business users that have a number of networked printers often find the toner or ink low warnings to be of little value since business tend to maintain an inventory of supplies. In either case, ordering of supplies from the web sites identified by printer interfaces is often a frustrating experience that discourages users from making purchases. Generally, the user must navigate through a series of pages and input a significant amount of information, such as printer type, payment and delivery information. Consumers become less likely to successfully complete an

order with each additional required entry due in part to the time and thought involved and in part to increased probability of a mistaken entry. Existing methods of filling information fields in web pages, such as the use of cookies to re-insert previously used information, do not offer sufficient security of private information, such as payment information. Businesses generally find it more convenient to maintain ink and toner stocks through services that periodically check and track printer supply consumption and inventory.

SUMMARY OF THE INVENTION

Therefore a need has arisen for a system and method which automatically orders information handling system peripheral supplies with reduced consumer interactions.

In accordance with the present invention, a system and method are provided which substantially reduce the disadvantages and problems associated with previous methods and systems for ordering information handling system peripheral supplies. Upon detection of a trigger event for ordering a consumable at an information handling system, order information is sent through a network to a consumable order server for pre-population of a consumable order form. The consumable order form is completed and presented at the information handling system so that a user of the information handling system may confirm the consumable order without having to add information to the order form.

More specifically, a consumable handler on an information handling system communicates with a peripheral driver, such as a printer driver, to monitor consumable status. If a consumable trigger event is determined, such as a predetermined consumable level relative to a consumption rate, then order information is sent from the information handling system through the Internet to a consumable order server. An order engine applies the order information to select an appropriate order form for a consumable associated with the order information, and a pre-population engine pre-populates the consumable order form with payment and delivery information. The pre-populated order form is presented at the information

handling system completed to support an order so that the user may simply confirm the order, or, update any inaccurate information and then submit the order. In one embodiment, multiple printers of multiple types are tracked with an accounting application so that the consumable order trigger event adjusts to manage an inventory
 5 of consumables for the printers of a complete business or business unit.

The present invention provides a number of important technical advantages. One example of an important technical advantage is that peripheral supplies, such as printer toner and ink, are ordered through a web site with minimal user interaction. Pre-population of the web page with printer supply order information, including
 10 ordered items, payment terms and delivery instructions, presents the user with an intuitive purchase decision that requires only confirmation of the order information by the user. Changes to the order information, if any, are made with minimal user interaction and, therefore, reduced risk of user error. Security of the user's private information is provided by the pre-population process, especially as compared with
 15 the use of readily accessible browser cookies to fill fields. Automated inventory management offers an integrated solution for complex networks having multiple printers to keep printer supply inventory to a desired level.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention may be better understood, and its numerous objects, features and advantages made apparent to those skilled in the art by referencing the
 20 accompanying drawings. The use of the same reference number throughout the several figures designates a like or similar element.

Figure 1 depicts a block diagram of a system for information handling system printer consumable orders;

25 Figures 2A and 2B depict graphical user interfaces for supporting consumable ordering through a pre-populated order form;

Figure 3 depicts a flow diagram of a process for information handling system consumable orders through pre-populated order forms; and

Figure 4 depicts a flow diagram of a process for automated orders for consumables for plural printers aided by an accounting system module.

DETAILED DESCRIPTION

Information handling system consumable orders are placed in a timely manner through a network with pre-populated order forms that reduce the user interactions needed to purchase the consumables. For purposes of this disclosure, an information handling system may include any instrumentality or aggregate of instrumentalities operable to compute, classify, process, transmit, receive, retrieve, originate, switch, store, display, manifest, detect, record, reproduce, handle, or utilize any form of information, intelligence, or data for business, scientific, control, or other purposes. For example, an information handling system may be a personal computer, a network storage device, or any other suitable device and may vary in size, shape, performance, functionality, and price. The information handling system may include random access memory (RAM), one or more processing resources such as a central processing unit (CPU) or hardware or software control logic, ROM, and/or other types of nonvolatile memory. Additional components of the information handling system may include one or more disk drives, one or more network ports for communicating with external devices as well as various input and output (I/O) devices, such as a keyboard, a mouse, and a video display. The information handling system may also include one or more buses operable to transmit communications between the various hardware components.

Referring now to Figure 1, a block diagram depicts a system to automate orders of information handling system consumables by using pre-populated order forms. Plural information handling systems 10 have printers 12 and displays 14 and interface with a network 16, such as the Internet. Printers 12 include laser printers that write information with consumable laser toner cartridges and ink jet printers that write information with consumable ink jet cartridges. Each information handling system 10 has an operating system 18, such as Windows, that coordinates operation of processing components that process information, such as the CPU, memory, hard disc drive and communications ports. A printer driver 20 associated with operating system 18 manages communication of information with printer 12, including the transfer of

processed information to printer 12 for printing and the transfer of management information from printer 12, such as ink or toner quantity levels and low level warnings.

5 A consumable handler 22 interfaces with printer driver 20 and monitors printer management information to detect a consumable order trigger event. For instance, consumable handler 22 tracks the toner or ink levels of printers 12, the time between toner and ink changes, and the number of pages printed or other indicia of daily or average use and usage patterns. The printer management information is applied against consumable trigger event settings to determine that a consumable
10 order trigger event has occurred and, thus, to automatically initiate a consumable order. The consumable order trigger event is set so that a consumable order will be delivered before the printer becomes inoperative. Consumables include laser toner for laser printers, ink jet cartridges for ink jet printers, paper as a writing medium, including special photographic paper for printing pictures, and any other type of
15 product consumed by usage at an information handling system. The occurrence of the trigger event is optionally presented at display 14 for confirmation by the information handling system user of the initiation of the automated consumable order process.

Consumable handler 22 initiates a consumable order for a consumable associated with the trigger event by sending order information through network 16 to
20 a consumable order server 26. An order engine 28 applies the order information to identify consumables ordered and an associated order form. Order engine 28 provides the order form and order information to a pre-population engine 29 for pre-population of the order form with payment and delivery information and then communicates the completed order form 30 to consumable handler 22 for presentation at display 14.
25 The user of information handling system 10 is able to review a completed order form and either confirm the pre-populated order form or correct only those items desired by the user. Confirmation of the order form is communicated by consumable handler 22 to order engine 28 for initiation of the delivery of the ordered consumable. Presentation of order form 30 may be supported through a browser 34 as a pop-up
30 page or as an e-mail.

A primary concern in the automated ordering of consumables is the security of private information, such as payment and delivery information of consumers, so that unauthorized purchases do not occur. One way to accomplish security is to have consumers sign up for the service with delivery and payment information at the initial purchase of the information handling system or printer. In one such embodiment, the order information provided from consumable handler 22 includes a unique identifier, such as a service tag for the information handling system or printer, that pre-population engine 29 uses in a look-up of information handling system unique ID database 32 to find associated payment and delivery information. In an alternative embodiment, the payment and delivery information are stored locally on information handling system 10, such as at manufacture or by a user's signing up for a consumable order service. Consumable handler 22 sends the payment and delivery information as the order information in an encrypted packet for subsequent use by pre-population engine 29 in the pre-population of the order form. In yet another embodiment, portions of the functionality of pre-population engine 29 are included within consumable handler 22 so that a partially completed order form from order engine 28 has payment and delivery information included by consumable handler 22 at information handling system 10 for presentation at display 30. In situations involving businesses with plural networked printers, an accounting application 36, such as Quick Books, integrates with consumable handler 22 to track consumable inventory and usage for determining a consumable order trigger event appropriate to a desired inventory level.

Referring now to Figure 2A, an example of a graphical user interface is depicted to illustrate a notice to an information handling system user or a consumable order trigger event. For instance, the ink level and usage rate have reached a point at which an order for additional ink is needed to ensure delivery of the ink before the current supply runs out. The user initiates the order by selecting the "order ink online" button and is next presented with the graphical user interface depicted by Figure 2B, which includes a completed order form. The fields of the order form include all of the information needed to submit an order for the consumable so that a user need only confirm the accuracy of the information, although each field is selectively correctable by the user should the user decide that changes are necessary.

Referring now to Figure 3, a flow diagram depicts a process for automated information handling system consumable ordering with a pre-populated order form. The process begins at step 40 with the detection of a consumable order trigger event. At step 42, order information is assembled at the information handling system, such as an identifier for the printer or information handling system or other locally stored quantity, payment and delivery preferences. At step 44, the order information is communicated to a consumable order server which identifies an appropriate consumable order form. At step 46, the order form is pre-populated with delivery and payment information, either at the order server or at the information handling system. At step 48, the completed order form is presented at the information handling system so that, at step 50, the user is able to accept the order confirmation with a single input. Once the user has accepted the consumable order, at step 52 the consumable is charged and delivered according to the payment and delivery instructions of the order form.

Referring now to Figure 4, a flow diagram depicts an example of automated consumable ordering with a pre-populated order form in cooperation with an accounting application or module. The process begins at step 54 with an initial consumable quantity, such as is established by an initial purchase or an audit of existing supplies. Consumable supplies that can be tracked include any item consumed by printer usage, including customer replaceable units (CRUs) such as a laser imaging drum or belt, print head device (PHD), or fuser kit, or even field replaceable units FRUs that invoke an automated request for service. At step 56, the initial consumable quantity is applied to update the inventory count of an accounting application and, at step 58, the available inventory of consumables are made accessible for use. At step 60, a printer message relating to a consumable, such as a toner or ink low message, results in replacement of the consumable, such as with a new toner or ink, and a decrement to the inventory of the accounting application at step 56. Each decrement to the inventory results in a message to a consumable handler at step 62 that compares the on-hand stock with consumable trigger event settings at step 64 to determine if an order for toner or ink is desired. If not, the process returns to step 62 to await the next decrement. If yes, the process continues to step 66 for automatic ordering of consumables to obtain a desired inventory level. At

step 68, the physical stock is updated upon delivery of the consumables. Advantageously, integration of automated consumable ordering with existing accounting applications, such as Quick Books, allows accurate tracking of consumables for multiple printers and multiple printer types and ease of management
5 of payment information for the automatically ordered consumables.

Although the present invention has been described in detail, it should be understood that various changes, substitutions and alterations can be made hereto without departing from the spirit and scope of the invention as defined by the appended claims.